

Title (en)

Quenching process and apparatus for practicing said process

Title (de)

Abschreckungsverfahren und Vorrichtung zur Ausführung des Verfahrens

Title (fr)

Procédé de trempe et appareil de mise en oeuvre dudit procédé

Publication

EP 2505676 B1 20170301 (EN)

Application

EP 12161357 A 20120326

Priority

US 201161468267 P 20110328

Abstract (en)

[origin: EP2505676A1] A process for quenching heat treated metal parts using a liquid quenchant and high pressure is disclosed. In general, the process includes the steps of providing a load of heat treated metal parts in a pressure vessel wherein the load is at an elevated temperature after being heat treated. In a subsequent step, a liquid quenchant is injected into the pressure vessel such that a vapor of the liquid quenchant forms rapidly in the pressure vessel and cools the metal parts. The step of injecting the liquid quenchant into the pressure vessel is continued for a time sufficient to establish a desired peak vapor pressure in the pressure vessel. An apparatus for carrying out the disclosed process is also described.

IPC 8 full level

C21D 1/613 (2006.01); **C21D 1/767** (2006.01); **C21D 1/773** (2006.01)

CPC (source: EP US)

C21D 1/613 (2013.01 - EP US); **C21D 1/767** (2013.01 - EP US); **C21D 1/773** (2013.01 - EP US); **C21D 9/0062** (2013.01 - EP US); **C21D 11/005** (2013.01 - EP US)

Citation (opposition)

Opponent : IVA Schmetz GmbH

- US 4667478 A 19870526 - JONES III ROBERT H [US]
- EP 1367139 A2 20031203 - SCHMETZ GMBH [DE]
- GB 1452062 A 19761006 - BOC INTERNATIONAL LTD
- WO 2008027900 A2 20080306 - AIR PROD & CHEM [US], et al
- FR 2379607 A1 19780901 - VIDE & TRAITEMENT SA [FR]
- EP 1737989 B1 20141105 - PELISSIER FRANCIS [FR]
- DE 102005015450 B3 20060817 - IPSEN INT GMBH [DE]
- WO 0236835 A1 20020510 - MESSER GRIESHEIM GMBH [DE], et al
- DE 102007029038 A1 20090102 - ELILOG KELVITHERM INDUSTRIEOFEN [DE]
- US 5924291 A 19990720 - WEILER JAMES MICHAEL [US], et al

Cited by

EP2712939B1

Designated contracting state (EPC)

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)

EP 2505676 A1 20121003; **EP 2505676 B1 20170301**; JP 2012207306 A 20121025; PL 2505676 T3 20170831; US 2012247627 A1 20121004; US 9617611 B2 20170411

DOCDB simple family (application)

EP 12161357 A 20120326; JP 2012073687 A 20120328; PL 12161357 T 20120326; US 201213427008 A 20120322